LAST ONE!

Customer gets a copy

Return this to the floor

LAST ONE!

Dranetz
626-PA-60114
op. vol. 1
TM 1110264-1

MP MASTER
MA23164

Thomas
Lee-Phillips
Op. Vol. 1
Tim Hilsley MT

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WARNING

Because of possible shock or fire hazards, connection of this instrument should be performed in compliance with the National Electrical Code (ANSI C1) and/or any other requirements which may be applicable to the user.

Installation, operation, and maintenance should be performed only by qualified personnel.

TM-111026U-1

VOLUME 1

OPERATOR'S MANUAL

626-PA-6014

8-CHANNEL TEMPERATURE MONITOR

NOTE

Refer to Volume 2 (Service Manual) of TM-111026U for maintenance data.

15 November 1982
(Rev. 1 July 1984)
(Rev. 1 Sept. 1985)
(Rev. 1 July 1986)
(Rev. 1 Sept. 1989)
(Rev. B)

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DRANETZ TECHNOLOGIES, INC.
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Edison, New Jersey 08818

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IMPORTANT! CALIBRATION INTERVAL

The recommended calibration interval for this unit is once every 12 MONTHS.

We recommend that you return the unit to the factory for calibration. If you decide to do so, first contact the Dranetz Customer Service Department to obtain an authorization number.

Telephone Number:	(201) 287-3680
Telex Number:	499-7808
TWX Number:	(710) 997-9553
FAX Number:	(201) 248-9240
Cable:	DRANETZ

Then fill out the Repair/Service Order form enclosed in this manual and ship it along with the unit to the Dranetz Customer Service Department. (If this form is missing, ask the Dranetz Customer Service Department for a replacement.)

1.4 EQUIPMENT CHARACTERISTICS

The 6014 is configured as a plug-in module 6.5" high by 1.25" wide by 10" deep. It is designed for installation in any one of the five slots of the Series 626 Universal Disturbance Analyzer. Technical specifications of the 6014 are listed in Table 1-1.

Table 1-1. 626-PA-6014 Specifications

Input Specifications	
Temperature Range:	-50 to +150 deg C
Accuracy	+/- 2 deg C from 0 to 100 deg C +/- 3 deg C otherwise
Cable Length:	100 ft. max (30.5 m)
Cable Temperature:	200 deg C max
Programmable Parameters	
Temperature	
Low Limit:	0 deg C min (-50 deg C via Preset)
High Limit:	154 deg C max
Sensitivity:	1 deg C min
Preset to:	LO=20, HI=30, SENS=2

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.5 STANDARD ACCESSORIES

Part No.	Quan.	Description
111059	8	Temperature Probe
TM-111026U, Vol. 1	1	Operator's Manual

1.6 OPTIONAL ACCESSORIES

Part No.	Quan.	Description
TM-111026U, Vol. 2	1	Service (Maintenance) Manual

1.7 FACTORY REPAIR

When factory repair is required, proceed as follows:

1. Contact the Dranetz Customer Service Department in order to obtain an Authorization Number for factory repair.

   Telephone No: (201) 287-3680

   TWX: (710) 997-9553

   FAX: (201) 248-9240

   Telex: 499-7808

   Cable: DRANETZ

2. Fill out the REPAIR/SERVICE ORDER form enclosed in the Series 626 Operating Manual. Ship it along with the malfunctioning equipment to the Dranetz Customer Service Department.

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SECTION II
INSTALLATION AND OPERATION

2.1 INSTALLATION

CAUTION

Be sure unit is turned off and that all power connected to all plug-in modules is off.

To install the 6014 in the mainframe, proceed as follows:

a. Position the top and bottom rear corners of the plug-in module in the upper and lower tracks at the desired slot position at the rear of the mainframe.

b. Carefully slide the module into the mainframe until it is firmly seated.

c. Tighten the top and bottom captive screws to secure the module to the mainframe.

2.1.1 Load Ratings

The Series 626 standard mainframe has an upper limit of the combined total rating of the installed modules. The overall mainframe capacity is set at 20 units, and individual modules have load ratings as follows:

Plug-in	Load Rating	Plug-in	Load Rating
626-PA-6001	2 Units	626-PA-60012A	3 Units
626-PA-6001 with Extra Option Board	3 Units	626-PA-6013	2 Units
		626-PA-6014	1 Unit
		626-PA-6015	4 Units
626-PA-6002	2 Units	626-PA-6018	4 Units
626-PA-6003	4 Units	626-PA-6020	4 Units
626-PA-6005	2 Units	626-PA-6024A	4 Units
626-PA-6006	2 Units	626-PA-6024B	4 Units
626-PA-6007	1 Unit	626-PA-6025	4 Units
626-PA-6008	2 Units	626-PA-6030	6 Units
626-PA-6009	4 Units	626-PA-6037	1 Unit
626-PA-6011	1 Unit	626-PA-6038	1 Unit
626-PA-6012	2 Units	626-PA-6040	6 Units

NOTE

When selecting modules for installation into any 626 Mainframe, verify that the sum of the load ratings of the installed modules DOES NOT exceed 20 Units.

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2.2 CONNECTING THE SENSOR PROBES TO THE MODULE

CAUTION: To avoid damaging the equipment, do NOT connect or disconnect the probes while the unit is turned on.

2.2.1 Connection Procedure

The 6014 is supplied with eight connectors on the rear panel. Proceed as follows:

a. Insert key in FUNCTION key switch on the front panel of the mainframe and set switch to OFF position.

b. Connect the sensor plugs (1-8) to the rear panel connectors.

2.2.2 Applications

Probes: The individual sensors may be clipped or taped in place. Tie wraps with eyelets are included for this purpose.

The cables may be extended up to 100' total by the use of the optional extension P/N 111056-G2.

Uses:
1) Within the computer room, distribute probes so as to pick up temperature shifts which may be caused by blocked air handling ducts.

2) Within a system cabinet, locate the probes so as to record "hot spots" which may arise, due to poor air circulation, failed or overstressed assemblies, etc.

2.3 OPERATING THE 6014

2.3.1 Operating Controls and Indicators

The functions of the mainframe operating controls and indicators associated with the 6014 are described in Table 2-1. Figure 2-1 shows the typical front panel controls associated with a 6014 on a Series 626. For a description of controls common to overall Series 626 operation, refer to Volume 1 of the Mainframe manual.

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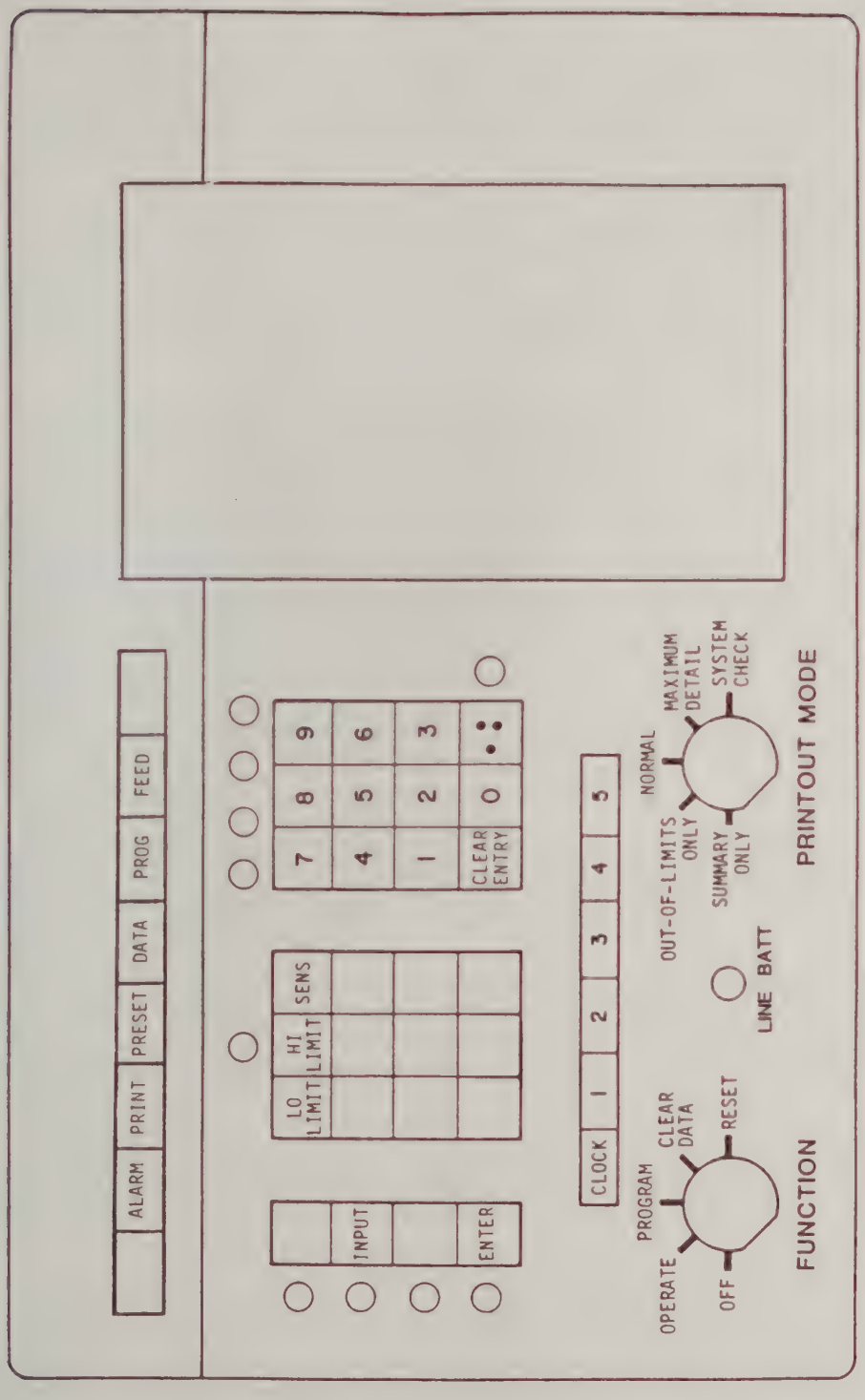

Figure 2-1. Series 626 Controls Used by the 6014 Plug-In

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Table 2-1. 6014 Operating Controls

Item	Function
INPUT pushbutton	Used to initiate channel input programming.
LO LIMIT pushbutton	When depressed, enables the numeric keyboard to program low limit for any temperature input.
SENS pushbutton	When depressed, enables numeric keyboard to program sensitivity for any input.
NUMERIC pushbuttons	When single lamp lights, user is cued to press a "1" to "8" for temperature inputs A to H, respectively. Also used to enter numerical values for other functions.
ENTER pushbutton	When depressed, transfers numeric keyboard values into 6014 memory for processing.
DATA pushbutton	When depressed, outputs data summary.
PROG pushbutton	When depressed, outputs program summary.
PRESET pushbutton	With FUNCTION switch set to PROGRAM and a channel switch (1-5) depressed, depressing PRESET switch recalls non-volatile factory program for that input.
HI LIMIT pushbutton	When depressed, enables the numeric keyboard to program high limit for any temperature input.

2.3.2 Programming Procedure

Assume it is desired to program Channel B for a temperature high limit of 35 deg C, a low limit of 15 deg C, and a sensitivity of 3 deg C.

For the example cited, program the 6014 as follows:

a. Set FUNCTION switch to PROGRAM.

b. Depress the channel pushbutton (1-5) that corresponds to the slot position of the plug-in to be programmed. Note that a program summary for that channel is immediately printed.

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c. Note that the red LED next to the INPUT pushbutton is it. Pushbutton must then be pressed. Note that the following prompt message is printed and a single yellow LED is lit.

626	626A,G,R,ARA
↑ INPUTS A - H ENTER: 1 - 8 FOR	ENTER: 1 - 8 FOR INPUTS A - H ↓

d. Depress a "1" thru "8", depending on which input you wish to change.

Note that the green LED adjacent to the ENTER key is lit, waiting for the ENTER key to be depressed.

(assume a "2" was depressed for the following example)

e. When the ENTER indicator goes out, an indicator above the center bank of pushbuttons lights. This indicates that one of the functions (HI LIMIT, LO LIMIT, SENSITIVITY) may now be programmed. At this time the PRESET button could also be depressed to change all of the parameters for all eight temperature inputs to factory-preset values.

NOTE: Custom Preset Option 101 allows the user to choose his/her own program setup for the PRESET function.

f. Depress the HI LIMIT pushbutton.

g. Note that three yellow LEDS above the numeric keyboard are now lit. Enter 035, using the keyboard. If an error is made, depress CLEAR ENTRY and then the correct entry. Note that the leading zero for numbers less than 100 must be entered.

h. When the value is entered, the lamp next to the ENTER pushbutton lights. Depress this pushbutton to enter the value.

i. Repeat steps c through h for the low limit value (015), using the LO LIMIT pushbutton.

j. Repeat steps c through h for the sensitivity value (03), using the SENS pushbutton. Note that only two yellow LEDS light in step g.

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k. The same sequence is used to change any temperature input, provided that the appropriate number is entered in step c.

l. The completed program printout should take the following form:

626

```
HIGH LIMIT Ø7Ø
LOW LIMIT Ø3Ø
SENS Ø1Ø
   INPUT H
HIGH LIMIT Ø55
LOW LIMIT Ø35
SENS Ø15
   INPUT G
HIGH LIMIT Ø35
LOW LIMIT Ø15
SENS Ø03
   INPUT F
HIGH LIMIT Ø75
LOW LIMIT Ø35
SENS Ø1Ø
   INPUT E
HIGH LIMIT Ø44
LOW LIMIT Ø05
SENS Ø03
        *
        *
        *
        *
        *
HIGH LIMIT Ø35
LOW LIMIT Ø15
SENS Ø03
   INPUT B
HIGH LIMIT 13Ø
LOW LIMIT Ø05
SENS Ø3Ø
   INPUT A

  626-PA-6Ø14
      CH2

PROGRAM SUMMARY
```

626A,G,R,ARA

```
PROGRAM SUMMARY

      CH 2
  626-PA-6Ø14

   INPUT A
SENS Ø3Ø
LOW LIMIT Ø05
HIGH LIMIT 13Ø
   INPUT B
SENS Ø03
LOW LIMIT Ø15
HIGH LIMIT Ø35
        *
        *
        *
        *
        *
SENS Ø03
LOW LIMIT Ø05
HIGH LIMIT Ø44
    INPUT E
SENS Ø1Ø
LOW LIMIT Ø35
HIGH LIMIT Ø75
    INPUT F
SENS Ø03
LOW LIMIT Ø15
HIGH LIMIT Ø35
   INPUT G
SENS Ø15
LOW LIMIT Ø35
HIGH LIMIT Ø55
   INPUT H
SENS Ø1Ø
LOW LIMIT Ø3Ø
HIGH LIMIT Ø7Ø
```

NOTE

The instrument is designed to detect an invalid entry. For example, if the high limit value is selected as 30 deg C, and the user selects a low limit value of 35 deg C, the following printout will appear.

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	626	626A,G,R,ARA	
↑	HI LIMIT Ø36 LO LIMIT Ø35	LO LIMIT Ø35 HI LIMIT Ø36	↓

m. When the plug-in program is completed, the user may proceed to program another module (by depressing another channel number) or he (she) may place the instrument on line by setting the FUNCTION switch to OPERATE. While on line, the program currently in effect may be obtained by simply depressing the PROG pushbutton.

2.4 DESCRIPTION OF DATA PRINTOUTS

When any of the disturbances described below is detected by the 6Ø14, it is recorded and displayed in characteristic manner.

2.4.1 Over Limit for Temperature

An over limit condition exists when the monitored average value of temperature exceeds the user-specified upper limit for the respective input. An over limit condition is indicated by a printout such as the following:

```
4B HI 1Ø:47:12.98
      or
4F HI 1Ø:47:Ø9.76
```

where the 4 is the channel number, the B is for temperature input B (or 2), the F is for temperature input F (or 6) and the time is given in hours, minutes and seconds (to Ø.Ø1 sec resolution).

When the temperature recovers to normal, a printout such as the following occurs:

	626	626A,G,R,ARA	
↑	4B NOR 1Ø:55:13.77 Ø73.3 DEG C MAX or 4F NOR 11:12:34.21 Ø65.5 DEG C MAX	Ø65.5 DEG C MAX 4F NOR 11:12:34.21 or Ø73.3 DEG C MAX 4B NOR 1Ø:55:13.77	↓

indicating when the normal temperature was restored and the value of the highest temperature reached during the over limit interval.

2.4.2 Under Limit for Temperature

An under limit condition exists when the monitored temperature goes below the user-specified lower limit. An under limit condition is indicated by a printout such as the following:

```
4A LO 13:33:23.78
      or
4D LO 12:59:ØØ.Ø1
```

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When the temperature returns to normal, a message such as the following is printed:

626	626A,G,R,ARA
4A NOR 13:44:56.98 Ø03.1 DEG C MIN or 4D NOR 12:59:58.99 Ø24.2 DEG C MIN	Ø24.2 DEG C MIN 4D NOR 12:59:58.99 or Ø03.1 DEG C MIN 4A NOR 13:44:56.98

indicating when the normal condition was restored and the value of the lowest temperature reached during the under limit interval.

2.4.3 Temperature Change

A temperature printout is triggered when the temperature changes more than a preselected amount from the last printed value. The change sensitivity is a user programmable value, which is selected independently for each temperature input. The following example shows several temperature input changes. The first indicates a temperature increase to 87.3 deg C on input E; the second shows a temperature decrease to 13.3 deg C on input C (both at times shown).

626	626A,G,R,ARA
2C DEC Ø1:22:34.76 Ø13.3 DEG C	Ø87.3 DEG C 2E INC Ø1:23:55.32
2E INC Ø1:23:55.32 Ø87.3 DEG C	Ø13.3 DEG C 2C DEC Ø1:22:34.76

The following example printouts show how various settings of the PRINTOUT MODE switch change the amount of detail in the printed record of a disturbance. It is assumed that the disturbances occurred in Channel 2 and that the limits for Channel 2 were programmed as follows:

Input A LOW LIMIT	25 DEG C
Input A HIGH LIMIT	55 DEG C
Input A SENSITIVITY	Ø5 DEG C

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Disturbances which occur while the PRINTOUT MODE switch is in the SUMMARY ONLY position do not generate individual printouts but they are stored in the daily accumulator and are automatically printed each day at midnight (worst case event and number of occurrences in each category). This printout may also be triggered by depressing the DATA button. The following is an example of a DATA summary. (The first is the Model 626 printout; the second is the 626A printout.)

Model 626

```
MAX  +085.6 DEG C          max temperature for day
HIGH  000 HT          number of high excursions
MIN  -044.8 DEG C          min temperature for day
LOW  012 HT           number of low excursions
PRES= +019.6 DEG C         present temperature
    INPUT H
MAX  +076.8 DEG C
```

626A,G,R,ARA

```
MAX   +076.8 DEG C
    INPUT H
PRES= +019.6 DEG C             present temperature
LOW   012 HT               number of low excursions
MIN   -044.8 DEG C             min temperature for day
HIGH  000 HT               number of high excursions
MAX   +085.6 DEG C             max temperature for day
```

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The following printouts (Models 626 and 626A) illustrate under limit in NORMAL mode, over limit in OUT-OF-LIMITS ONLY mode and a data summary.

626

```
HIGH  001 HT
MIN  +034.0 DEG C
LOW  000 HT
MAX  +134.9 DEG C
HIGH  003 HT
MIN  -048.9  DEG C
LOW  003 HT
PRES= +045.5 DEG C
     INPUT A

 626-PA-6014
    CH2
10/14/83   10:48:15
  DATA SUMMARY

2A NOR 12:56.38.51
   078.2 DEG C

2A HI 12:56:34.52


2A NOR 03:55:45.98
   013.5 DEG C

2H INC 03:53:34.89
   024.8 DEG C

2A INC 03:50:57.67
   019.3 DEG C

2A DEC 03:40:11.23
   013.5 DEG C

2A DEC 03:39:45.33
   021.1 DEG C


2A LO 03:39:45.33
```

Data Summary

Printout of over limit in OUT-OF-LIMITS ONLY mode

Printout of under limit in NORMAL mode.

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626A,G,R,ARA

```
2A LO Ø3:39:45.33

   Ø21.1 DEG C
2A DEC Ø3:39:45.33

   Ø13.5 DEG C
2A DEC Ø3:40:11.23

   Ø19.3 DEG C                    Printout of under limit
2A INC Ø3:50:57.67                in NORMAL mode.

   Ø24.8 DEG C
2H INC Ø3:53:34.89

   Ø13.5 DEG C
2A NOR Ø3:55:45.98


2A HI 12:56:34.52

   Ø78.2 DEG C                    Printout of over limit
2A NOR 12:56:38.51                in OUT-OF-LIMITS mode.


  DATA SUMMARY                    Data Summary
1Ø/14/83   1Ø:48:15
    CH2
 626-PA-6Ø14

     INPUT A
PRES= +Ø45.5 DEG C
LOW  ØØ3 HT
MIN  -Ø48.9  DEG C
HIGH  ØØ3 HT
MAX  +134.9 DEG C
LOW  ØØØ HT
MIN  +Ø34.Ø DEG C
HIGH  ØØ1 HT
```

2.5 SHORT TERM ACCUMULATOR

If disturbances should take place at a rate faster than the 626 mainframe can process and print them out, and the internal event stack memory should overflow, then subsequent events are stored in summary form in the Short Term Accumulators (until the overflow condition is cleared). These values are cleared out after the printout of the Short Term Accumulators is complete. The format is identical to the Data Summary except the values are printed out only when a HI or LO limit is crossed to expedite the printing.

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SECTION III
OPERATIONAL TEST

3.1 GENERAL

This section provides information for performing an operational test to verify that the 6014 plug-in is operating properly.

3.2 SYSTEM CHECK

When the PRINTOUT mode switch is set to SYSTEM CHECK, the precision reference signals are applied to the measuring circuitry. The probe inputs are disconnected during this time. These signals verify the operational status of the module, but not the actual sensors. The sensors can be checked by the use of a calibrated standard (a precise temperature chamber). The allowable tolerance levels are described below, along with a sample printout:

626

```
**********************

      V3=000.0        +  0.2
      V2=010.2        +/-0.3
      V1=091.9        +/-0.6

    626-PA-6014
       CH2

10/17/83   12:34:56.78
  ***SYSTEM CHECK***

**********************
```

626A,G,R,ARA

```
*************************

   ***SYSTEM CHECK***
10/17/83    12:34:56.78

        CH2
   626-PA-6014

     V1=091.9        +/-0.6
     V2=010.2        +/-0.3
     V3=000.0        +  0.2

*************************
```

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MP MASTER
MA23164